DESY
Particle and Astroparticle Physics Colloquium

Light but with a chance of showers: Phenomenology of strongly interacting dark sectors.

Tuesday, 4 Novemb, 2025
Auditorium & Webcast 16:00 h

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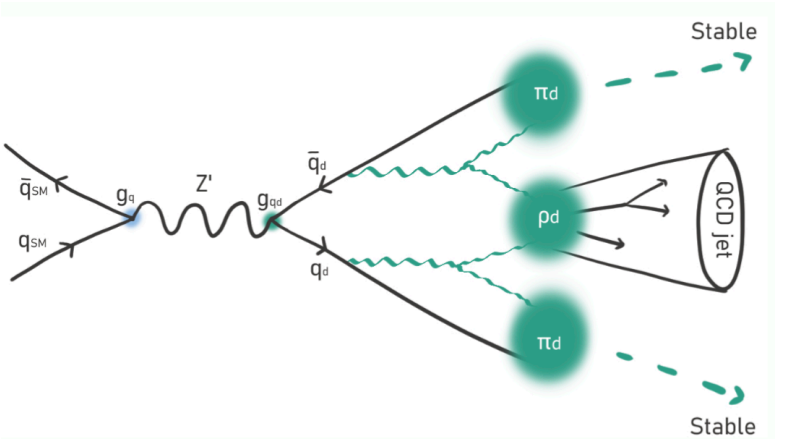
Models of strongly-interacting dark sectors are based on the idea that there may be a new type of matter that behaves similar to quarks and gluons but couples very weakly to visible matter. In such a set-up, dark quarks interacting via a new non-Abelian gauge extension of the Standard Model would confine into dark mesons and baryons at low energies. Some of these dark hadrons may be stable and provide a viable dark matter candidate. I will first discuss the cosmological and astrophysical constraints on such models and argue that these considerations favour particle masses around the GeV-scale.

At accelerator experiments, the pair production of dark quarks would give rise to dark showers with a high multiplicity of dark mesons. If some of these dark mesons decay into Standard Model particles, we can expect exciting exotic signatures, such as semi-visible jets or displaced vertices. I will discuss existing constraints and opportunities from searches for long-lived particles at Belle II, the proposed SHiP experiment and in Higgs boson decays at FCC-ee.



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